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Four New Monogenea (Axinidae and Heteraxinidae) from Eastern Pacific Ocean Fishes

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ABSTRACT: Five species of Monogenea are reported from fishes of the eastern Pacific Ocean along the coast of California, U.S.A., and Baja California, Mexico. *Nudaciraxine cabosanlucensis* sp. n. (Axinidae: Axinoidinae) from gills of *Ablennes* sp. (Belonidae) from south of Cabo San Lucas, Baja California Sur, Mexico, differs from *N. gracilis* in clamp width, outer marginal hook size and shape, testes number and arrangement, and vaginal pore location. *Zeuxapta taylori* sp. n. (Heteraxinidae: Heteraxininae) from gills of *Thunnus albacares* (Scombridae) from southwest of San Diego, California, U.S.A., differs from *Z. kahala* in mouth structure, cirrus shape, esophageal diverticula, and host family. *Allencotyla pricei* (Heteraxinidae: Heteraxininae) is reported from new hosts, *Embiotica jacksoni* (Embiotocidae) and *Phanerodon atripes* (Embiotocidae), and the geographic distribution is extended southward from the waters off Redondo Beach, California, to La Jolla, California, and northward to Morrow Bay, California. *Leuresthicola robersoni* sp. n. (Heteraxinidae: Monaxininae) from gills of *Atherinops affinis* (Atherinidae) from off La Jolla, California, differs from *L. olsoni* in clamp number, size and structure, testes number, genital atrium spine size, and host genus. *Cynoscionicola powersi* (Heteraxinidae: Cynoscionicolinae) from gills of *Seriphus politus* (Sciaenidae), *Menticirrhus undulatus* (Sciaenidae), and *Umbrina roncador* (Sciaenidae) from off La Jolla, California, differs from *C. srivastavai* in haptor shape, anterolateral atrial pouch trirooted spines, and host species.

KEY WORDS: Monogenea, Axinidae, Heteraxinidae, *Nudaciraxine cabosanlucensis* sp. n., *Zeuxapta taylori* sp. n., *Allencotyla pricei, Leuresthicola robersoni* sp. n., *Cynoscionicola powersi* sp. n., eastern Pacific Ocean, California, U.S.A., Baja California, Mexico, fishes, *Ablennes* sp., *Thunnus albacares, Embiotica jacksoni, Phanerodon atripes, Atherinops affinis, Seriphus politus, Menticirrhus undulatus, Umbrina roncador,* zoogeography.

This paper is the fourth in a series (Payne, 1986, 1987a, b) on Monogenea from fishes from the eastern Pacific Ocean off California, U.S.A., and Baja California, Mexico, and deals with the description and zoogeography of several species belonging to the families Axinidae Monticelli, 1903 and Heteraxinidae Unnithan, 1957. Unnithan (1957) raised Axininae Monticelli, 1903 to family status and emended the diagnosis. The family was reviewed by Price (1962a) and Yamaguti (1963). Price (1962b) elevated Heteraxininae Unnithan, 1957 to family status, believing the asymmetrical haptor and posteriorly directed ends of the ovary to be of familial taxonomic importance. This view was supported by Kritsky et al. (1978) in their brief review of Heteraxinidae.

Materials and Methods

The fish collection methods and the techniques for the preparation and study of the monogeneans were those described by Payne (1986, 1987a, b). Figures were drawn with the aid of a drawing tube. Measurements are in micrometers unless otherwise indicated; ranges are followed by means in parentheses. Larval hook terminology follows Llewellyn (1970). Representative specimens have been deposited in the United States National Museum (USNM) Helminthological Collection, Beltsville, Maryland, and the Harold W. Manter Laboratory (HWML), Division of Parasitology, University of Nebraska State Museum, Lincoln; the balance of the specimens are in the author's collection.

Results

Axinidae Monticelli, 1903

Axinoidinae Price, 1962

Nudaciraxine cabosanlucensis sp. n. (Figs. 1–6)

DESCRIPTION (based on 2 specimens): With characters of the genus. Total length 1.762–1.919 (1.840) mm, maximum width 329–439 (384) at level ovary, both specimens markedly contracted. Buccal suckers 35–42 (39) wide, aseptate with row of minute denticles around aperture. Haptor asymmetrical; 705 long with single row of 48–54 (52) clamps. Clamps 31–33 (32) long by 48–57 (54) wide with thin muscular base; sclerites slender; lateral sclerites of dorsal jaw jointed; median sclerite spring with prominent bifid terminations. One pair hamuli, 1 pair marginal

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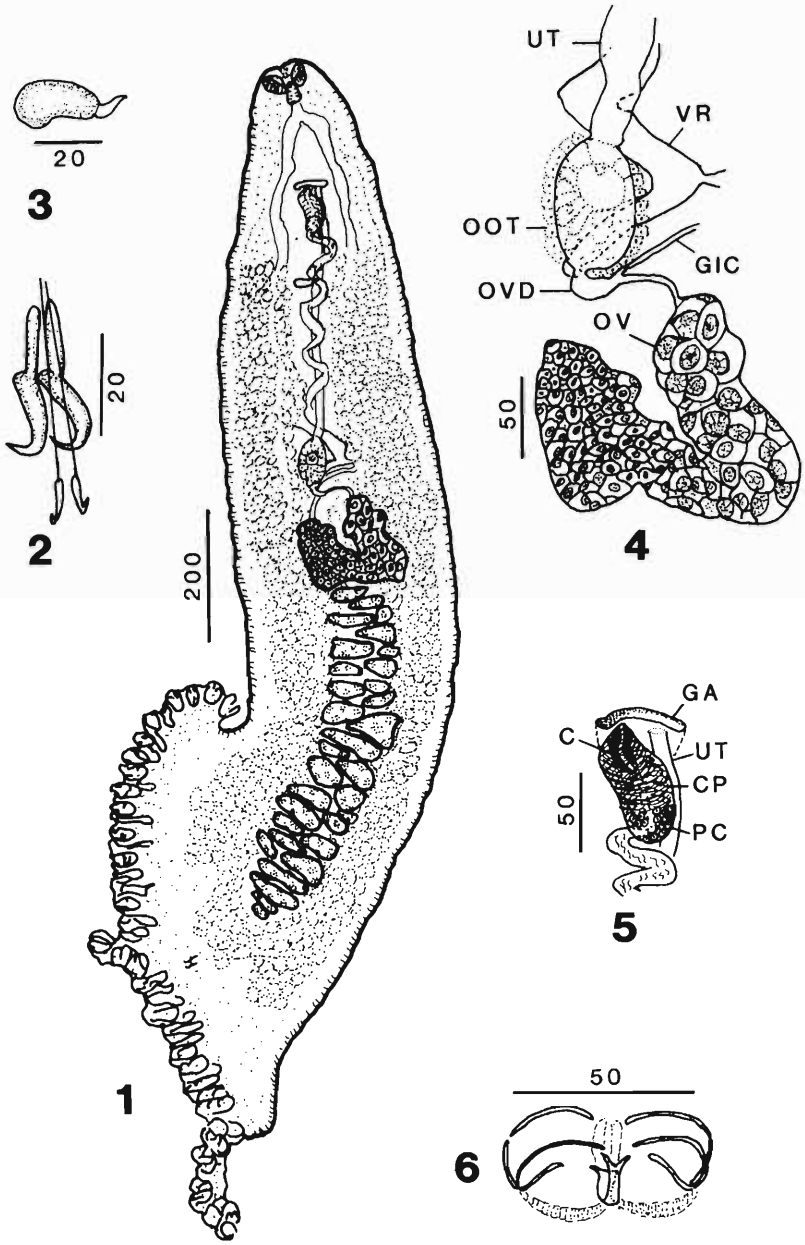


Figures 1–6. ***Nudaciraxine cabosanlucensis*** **sp. n., holotype, all ventral view. 1. Whole mount. 2. Marginal hooks and hamuli. 3. Vaginal spine. 4. Female reproductive system. 5. Genital atrium. 6. Entire clamp. Abbreviations: C, cirrus; CP, cirrus pouch; GA, genital atrium; GIC, genitointestinal canal; OOT, ootype; OV, ovary; OVD, oviduct; PC, prostatic cells; UT, uterus; VR, vitelline reservoir. Scales in micrometers.**

hooks present, 19–20 clamp spaces from posterior; hamuli 30 long, handle 17–20 (18), blade 10–15 (13); marginals I between hamuli, slender, 43 long, handle 33, blade 10.

Mouth subterminal, 62–73 (68) wide. Pharynx 33–44 (39) long by 20–23 (22) wide. Esophagus bifurcating immediately posterior to pharynx. Ceca diverticulate laterally, occasionally medially.

Testes 32, irregular, 20–62 (36) long by 37–92

(70) wide, intercecal. Vas deferens sinuous, median. Cirrus unarmed within muscular cirrus pouch; cirrus pouch 64–70 (67) long by 22–31 (27) wide; prostatic cells lining posterior portion of cirrus pouch. Genital atrium 48–52 (50) wide, 93–99 (96) posterior to pharynx, unarmed.

Ovary U-shaped, 253–396 (324) long, near midbody. Seminal receptacle not observed. Genitointestinal canal sinistral. Ootype somewhat dextral, lying anterior to proximal end of ovary; uterus somewhat thickened, medial, extending anteriorly. Vitelline follicles coextensive with ceca, posterior to level vagina; vitelline reservoir sinuous near ootype. Vaginal pore median, 136–183 (160) posterior to genital atrium, armed with horn-shaped spine 29–33 (31) long by 11 wide. Eggs not observed.

HOST: *Ablennes* sp. (needlefish), Belonidae, 45.0 cm S.L.

HABITAT: Gill lamellae.

LOCALITY: South of Cabo San Lucas, Baja California Sur, Mexico (22°34′N, 109°06′W).

DEPTH: Surface (caught by dipnet at night).

PREVALENCE AND INTENSITY: 2 specimens on the 1 fish examined.

SPECIMENS DEPOSITED: Holotype: USNM Helm. Coll. No. 80948. Paratype: USNM Helm. Coll. No. 80949.

ETYMOLOGY: The specific name recognizes the type locality.

REMARKS: *Nudaciraxine cabosanlucensis* most closely resembles *N. gracilis* (Linton, 1940) Price, 1962 in shape of body, buccal suckers, and haptor; by having an unarmed cirrus and genital atrium; and in distribution of vitellaria. It differs from *N. gracilis* by having narrower clamps (48–57 versus 75–100 wide), smaller lateral marginal hooks (30 versus 32–38 long), lateral marginal hook shape, more testes (32 versus 20–22), testes not tandemly arranged, a cirrus bulb or pouch provided with prostatic cells, and a median vaginal pore.

Previous to this study, *Nudaciraxine* was monotypic. Because *N. cabosanlucensis* agrees with the original generic diagnosis (Price, 1962a) in all details except the location of the vaginal pore, the original generic diagnosis should be emended as follows: Vaginal pore dorsal, median to submedian, armed with hornlike spine.

Nudaciraxine gracilis has been reported from the Atlantic needlefish, *Strongylura marina* (Walbaum), from Woods Hole, Massachusetts, and the New York Aquarium (Linton, 1940), Alligator Harbor, Florida (Hargis, 1956), and Veracruz, Mexico (Bravo-Hollis, 1984). This is the first report of *Nudaciraxine* from the Pacific Ocean.

Heteraxinidae Unnithan, 1957

Heteraxininae Unnithan, 1957

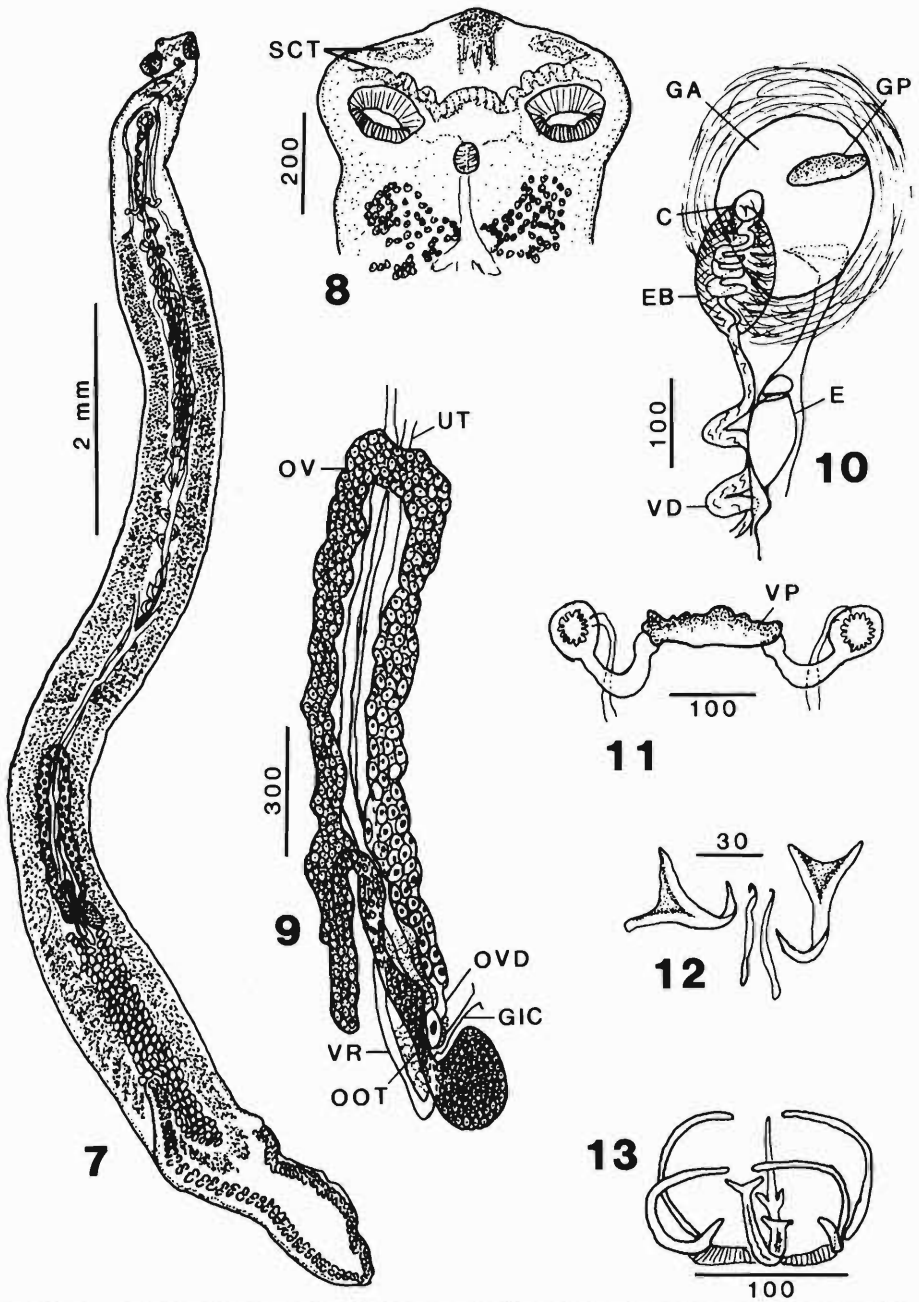
***Zeuxapta taylori* sp. n.**
(Figs. 7–13)

DESCRIPTION (based on 6 specimens, 5 measured): With characters of the genus. Body elongate, slender. Total length 7.497–14.469 (10.986) mm, maximum width 470–983 (810) immediately anterior to haptor. Buccal suckers 82–117 (106) long by 101–195 (143) wide, aseptate. Haptor 3.015–3.97 (3.493) mm long, asymmetrical, with 60–89 (80) clamps total; long row of 30–46 (41) clamps; short row of 30–44 (39) clamps. Clamps of *Microcotyle* type, 44–117 (75) long by 59–215 (125) wide, largest clamp long row 121–215 (164) wide, largest clamp short row 129–169 (145) wide; median sclerite spring with prominent bifid terminations, slender trident-shaped accessory piece at dorsal termination of median sclerite. Smallest specimen with 2 pairs larval hooks: 1 pair large hamuli 48–53 (51) long by 36–44 (40) wide, 1 pair slender marginals I 48–51 (50) long.

Mouth subterminal, wide, with convoluted ventral margin. Pharynx subspherical, 55–63 (59) long by 51–59 (55) wide, weakly muscular, between buccal suckers. Esophagus diverticulate; ceca simple from bifurcation to anterior margin of vitellaria, with lateral and median diverticula throughout remainder of body proper, extending into haptor; not confluent posteriorly.

Testes subspherical, 62–133 (92) wide, approximately 105–120 in number. Vas deferens running anteriorly along median axis, convoluted distally; ejaculatory duct convoluted in muscular ejaculatory bulb; cirrus a small stout papilla. Genital atrium 157–294 (239) long by 137–254 (200) wide, surrounded by circular muscles; genital pore 86–137 wide, midventral, 839–1,137 (988) from anterior end.

Ovary slender, 2.753–3.876 (3.552) mm long by 147–210 (167) wide, intercecal, in third quarter of body length; proximal end dextral, extending anteriorly short distance, crossing median line to sinistral side, descending to near level of proximal end, turning and ascending to anteriormost extent, recrossing median line, and descending on dextral side almost to point of origin; oviduct short; genitointestinal canal dex-



Figures 7–13. ***Zeuxapta taylori*** **sp. n., all holotype and dorsal view unless otherwise stated. 7. Whole mount. 8. Anterior end, paratype. 9. Female reproductive system. 10. Genital atrium. 11. Vagina, paratype. 12. Marginal hooks and hamuli, paratype. 13. Entire clamp. Abbreviations: E, egg; EB, ejaculatory bulb; GP, genital atrium pore; SCT, sticky convoluted tegument; VD, vas deferens; VP, vaginal pore; other abbreviations as in Figures 1–6. Scales in micrometers.**

tral. Ootype with Mehlis's cells in region between proximal and distal ends of ovary. Vitelline reservoir Y-shaped, slender, median; vitelline follicles small, coextensive with cecal diverticula, extending short distance into haptor. Uterus median, extending anteriorly, opening into genital atrium, distended with eggs in gravid specimens. Vagina dorsomedian, 1.405–1.954 (1.665) mm

from anterior end; pore transversely oval, opening laterally into paired spherical chambers lined with villi. Eggs elliptical, 117–129 (124) long by 55–62 (59) wide, with long fine filament at abopercular pole.

HOST: *Thunnus albacares* (Bonnaterre) (yellowfin tuna), Scombridae.

HABITAT: Gill lamellae.

LOCALITY: Pacific Ocean, southwest of San Diego, California (32°30′N, 117°30′W).

DEPTH: Less than 50 m.

PREVALENCE AND INTENSITY: On 1 of 6 fish examined (16.7%), 6 per host.

SPECIMENS DEPOSITED: Holotype: USNM Helm. Coll. No. 80950. Paratypes: USNM Helm. Coll. No. 80951, HWML No. 31158.

ETYMOLOGY: The specific name honors Mr. Arthur Taylor, owner-operator of the *M/V Searcher*.

REMARKS: *Zeuxapta taylori* most closely resembles *Z. kahala* (Yamaguti, 1968) Ogawa and Egusa, 1980 (=*Z. kahara* of Ogawa and Egusa, 1980) in size and shape of body, buccal suckers, clamps, ovary, eggs, and vagina; number of clamps; and distance of genital atrium from anterior end. It differs from *Z. kahala* in shape of cirrus and lack of cirrus bulb and by having a mouth with a conspicuous convoluted surface along the ventral margin, prebifurcal diverticula, a haptor with a sinistral long side, larger maximum clamp width (215 versus 180), and a host from a different family. Rohde (1981) studied the ultrastructure of the buccal organs of *Z. seriolae* (Meserve, 1938) Price, 1962 and described the convoluted surface as "sticky" tegument. Rohde (1978) synonymized *Z. japonica* Yamaguti, 1963 with *Z. seriolae* and discussed the distribution of the genus. The transfer of *Aspinatrium kahala* Yamaguti, 1968 to *Zeuxapta* by Ogawa and Egusa (1980) extended the distribution of the genus into the central tropical Pacific. The present study extends the distribution of the genus to the somewhat cooler waters of the California Current off the coast of southern California and northern Baja California, Mexico.

Allencotyla pricei Kritsky, Noble, and Moser, 1978

DESCRIPTION (based on 14 specimens, 6 measured): With characters of the genus. Total length 4.25–7.817 (6.098) mm; maximum width 1.331–2.202 (1.646) mm at level of ovary. Buccal suckers 62–93 (82) wide, aseptate. Haptor 1.705–3.049 (2.595) mm long by 0.961–2.495 (1.973) mm wide, asymmetrical. Clamps 44–57 (52) total; long side clamps 29–42 (36) in number, 81–136 (106) long by 78–155 (122) wide; short side clamps 15–17 (16) in number, 74–127 (99) long by 93–143 (122) wide.

Pharynx spherical; esophagus laterally diverticulate. Ceca with lateral and medial diverticula, not confluent posteriorly.

Testes subspherical to irregular, 74–127 (99) in number, intercecal. Genital atrium 87–99 (93) wide, armed with 7 or 8 bent spines and numerous straight spines.

Ovary question mark-shaped. Vagina 217–260 (239) wide, armed with numerous elongate spines 54–80 (70) long, and 2 large lateral spines 83–99 (93) long. Genitointestinal canal dextral.

HOSTS: *Embiotoca jacksoni* Agassiz (black perch), Embiotocidae, 15.7–18.0 cm S.L. (new host record); *Phanerodon atripes* (Jordan and Gilbert) (sharpnose seaperch), Embiotocidae, 18.1–20.4 cm S.L. (new host record); *Rhacochilus vacca* (Girard) (pile perch), Embiotocidae, 25.3–26.2 cm S.L.

HABITAT: Gill lamellae.

LOCALITIES: *E. jacksoni* from La Jolla, California (32°52′N, 117°15′W), and UCSB Beach, Goleta, California (34°27′N, 119°50′W); *P. atripes* from Morrow Bay, California (35°20′N, 120°51′W); *R. vacca* from Leadbetter Beach, Santa Barbara, California (34°25′N, 119°42′W).

DEPTH: Less than 10 m.

PREVALENCE AND INTENSITY: On 4 of 23 *E. jacksoni* examined (17.4%), 1–4 per host; on 1 of 2 *P. atripes* examined (50%), 1 per host; on 2 of 2 *R. vacca* examined (100%), 2 or 3 per host.

SPECIMENS DEPOSITED: USNM Helm. Coll. Nos. 80952, 80953; HWML Nos. 31150, 31152.

REMARKS: Kritsky et al. (1978) described *Allencotyla pricei* from the gills of *Damalichthys vacca* (now in *Rhacochilus*) from Redondo Beach, California. The 16 specimens studied in the present collection agree with the type series in general morphology. All measurement ranges overlapped, but those in the present study had lower averages: total length 6.098 versus 7.660 mm, buccal suckers 82 versus 93 wide, haptor length 2.595 versus 2.910 mm, haptor width 1.973 versus 2.230, dextral clamps 106 long by 122 wide versus 118 by 138, sinistral clamps 99 long by 122 wide versus 111 by 128, genital atrium width 93 versus 110, and vagina width 239 versus 296.

The geographic range of *A. pricei* is extended along the coast of southern California from Los Angeles County southward to San Diego County

and northward to Monterey County. The following species of embiotocids collected from the California coast were not found to be infected with *Allencotyla pricei*: 5 *Embiotica lateralis* Agassiz collected from near Pt. Arguello and San Francisco Bay, 3 *Phanerodon furcatus* Girard, and 5 *Rhacochilus toxotes* Agassiz collected from La Jolla, California.

Monaxininae Unnithan, 1957

Leuresthicola robersoni sp. n. (Figs. 14–19)

DESCRIPTION (based on 3 specimens): With characters of the genus. Body broadly fusiform, anterior one-fourth narrow. Total length 2.817–3.931 (3.535) mm, maximum width 1.527–2.036 (1.718) mm at level ovary. Buccal suckers 42–46 (44) long by 48–55 (51) wide, paired, aseptate, subspherical. Haptor asymmetrical, 1.018–1.440 (1.192) mm long with single row of 25–31 (27) clamps. Clamps 44–59 (56) long by 62–70 (66) wide; median sclerite spring with prominent bifid terminations; slender accessory piece at dorsal termination median sclerite; dorsal jaw with 6 or 7 delicate tegumental bars.

Mouth subterminal. Pharynx subspherical 48–55 (51) long by 44–46 (45) wide. Esophagus with lateral diverticula; ceca with lateral and medial diverticula, confluent in haptor.

Testes 46–117 (73) long by 53–148 (100) wide, 20–25 (22) in number, intercecal. Vas deferens median, extending anteriorly. Prostatic vesicle absent. Cirrus unarmed. Genital atrium cup-shaped, 57–62 (59) long by 55–88 (76) wide, armed with 36 spines; 3 lateral spines on each side 23–27 (25) long, bottle- or club-shaped; remaining spines 9–15 (12) long, with terminal hook.

Ovary 1.440–1.632 (1.528) mm long, question mark-shaped, ends directed posteriorly. Seminal receptacle ovoid, 84–87 (86) long by 56–67 (63) wide, dextral between proximal and distal ends of ovary, genitointestinal canal dextral. Ootype median, between proximal portion of ovary and anteriormost testes, Mehlis's gland cells sinistral, extending anteriorly. Vitelline follicles coextensive with intestinal ceca, extending in 2 narrow bands to level of genital corona; vitelline reservoir Y-shaped. Uterus median. Eggs 203–289 (240) long by 91–133 (107) wide, filamented both poles; long filament on opercular pole; shorter filament with distal knob.

HOST: *Atherinops affinis* (Ayres) (topsmelt), Atherinidae, 14.2–19.5 cm S.L.

HABITAT: Gill lamellae.

LOCALITY: Scripps Institution of Oceanography, La Jolla, California (32°52'N, 117°15'W).

DEPTH: Less than 10 m.

PREVALENCE AND INTENSITY: On 2 of 8 fish examined (25%), 1 or 2 per host.

SPECIMENS DEPOSITED: Holotype: USNM Helm. Coll. No. 80954. Paratypes: USNM Helm. Coll. No. 80955, HWML No. 31157.

ETYMOLOGY: The specific name honors Mr. Wiley G. Roberson for his friendship and contribution to marine biology education in Los Angeles County.

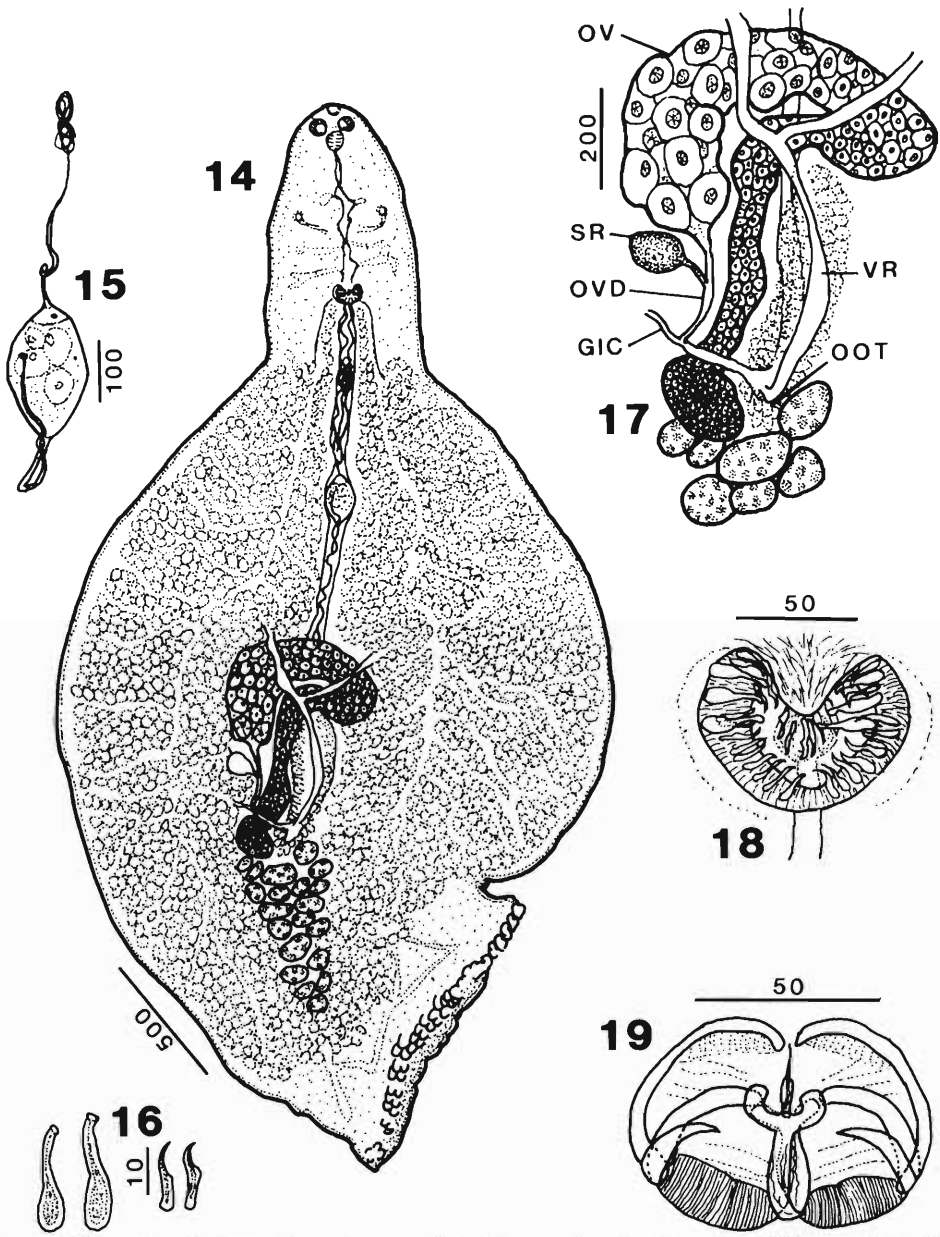
REMARKS: *Leuresthicola robersoni* most closely resembles *L. olsoni* Price, 1962 (type and only other species in the genus) in shape of body, ovary, genital atrium, atrial spines, and testes, in location of seminal receptacle, and in distribution of vitellaria. It differs from *L. olsoni* by having fewer clamps (25–31 versus 37–41), smaller clamps (62–70 versus 90–100 wide), a median sclerite bearing accessory piece, fewer testes (20–25 versus 34–37), smaller atrial spines (9–15 versus "about 20" for smaller spines and 23–27 versus "about 30" for larger bottle-shaped spines), and a different host genus.

The genus *Leuresthicola* has been reported only from the waters of the eastern Pacific Ocean off San Diego and La Jolla, California (Price, 1962b; Bravo-Hollis, 1978).

Cynoscionicolinae Bravo-Hollis, 1981

Cynoscionicola powersi sp. n. (Figs. 20–27)

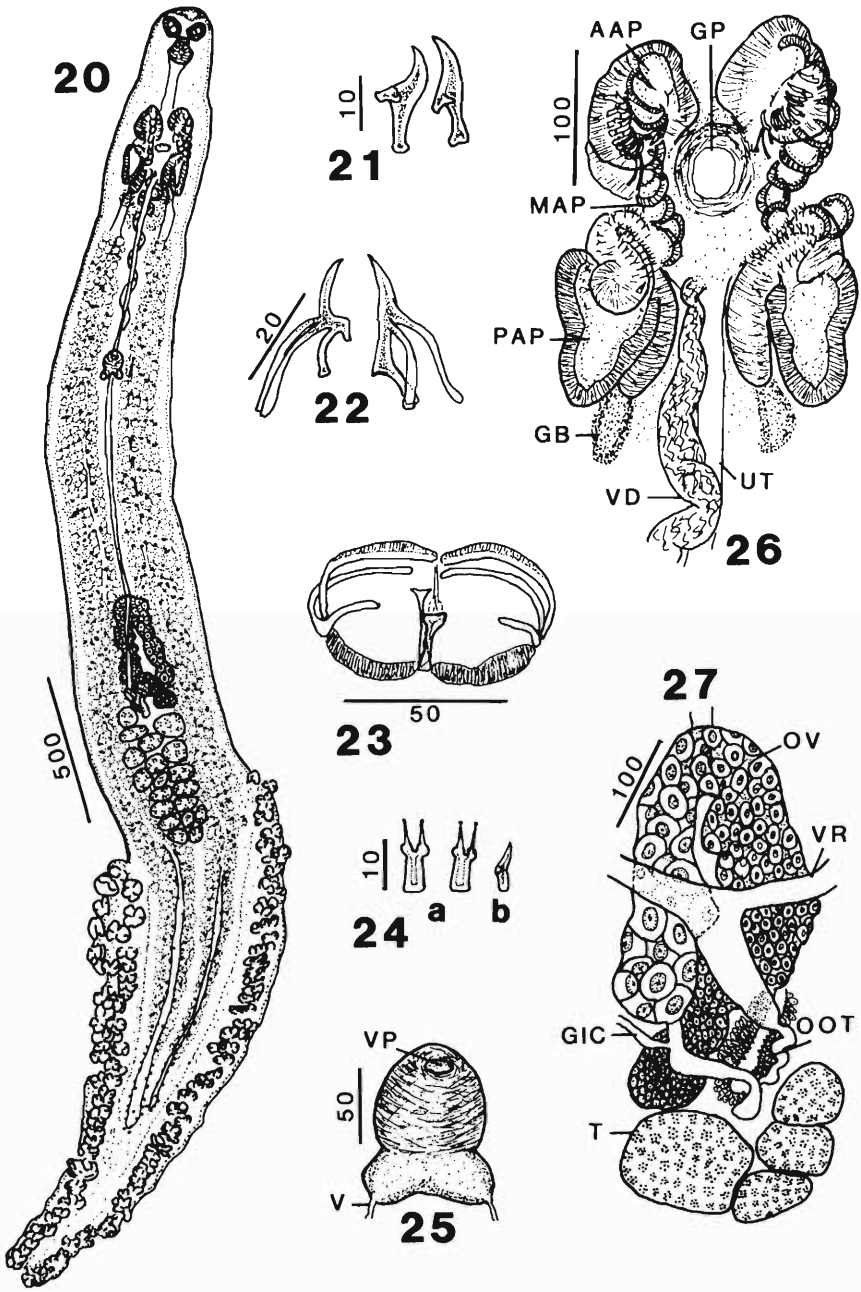
DESCRIPTION (based on 27 specimens, 10 measured): With characters of the genus. Body elongate, 3.214–4.875 (4.438) mm long by 282–647 (490) wide immediately anterior to haptor. Buccal suckers ovoid, 35–53 (46) long by 42–86 (61) wide, septate. Haptor gradually narrows posteriorly, somewhat asymmetrical with 2 rows of clamps; long side dextral, 1.566–2.932 (2.302) mm long with 60–89 (74) clamps; short side sinistral, 1.308–2.371 (1.701) mm long with 45–66 (56) clamps. Clamps of *Microcotyle* type; sclerites thin; lateral sclerites of dorsal jaw covered with thin layer of muscles distally; median spring sclerite with straight delicate accessory piece. Dextral clamps: anteriormost clamp 20–41 (34) long by 29–68 (47) wide; largest clamp



Figures 14–19. ***Leuresthicola robersoni*** **sp. n., all holotype and ventral view. 14. Whole mount. 15. Egg. 16. Genital atrium spines. 17. Female reproductive system. 18. Genital atrium. 19. Entire clamp. Abbreviations: SR, seminal receptacle; other abbreviations as in Figures 1–13. Scales in micrometers.**

33–48 (39) long by 59–81 (74) wide; terminal clamp 29–37 (31) long by 46–51 (48) wide. Sinistral clamps: anteriormost clamp 20–55 (32) long by 33–70 (45) wide; largest clamp 33–51 (42) long by 55–86 (73) wide; terminal clamp 26–31 (29) long by 40–50 (45) wide. Larval marginal hooks not observed.

Mouth subterminal. Pharynx 62–84 (76) long by 48–68 (58) wide, anterior one-third constricted. Esophagus 198–253 (222) long, simple, bi-



Figures 20–27. ***Cynoscionicola powersi*** **sp. n., all holotype and dorsal view unless otherwise stated. 20. Whole mount. 21. Anterolateral atrial pouch spines. 22. Anterolateral atrial pouch trirooted spines, paratypes. 23. Entire clamp. 24a. Posterolateral atrial pouch bifid spine, paratype. 24b. Posterolateral atrial pouch simple spine, paratype. 25. Vagina. 26. Genital atrium complex. 27. Female reproductive system, ventral view. Abbreviations: AAP, anterolateral atrium pouch; GB, glandular base; MAP, middle atrium pouches; PAP, posterolateral atrium pouch; T, testis; V, vagina; other abbreviations as in Figures 1–13. Scales in micrometers.**

furcating at level of genital atrium. Ceca with small lateral and medial diverticula, extending as simple ceca deep into haptor, unequal in length, not confluent.

Testes 9–22 (17) in number; rounded to ovoid, largest 33–139 (82) long by 68–222 (112) wide. Vas deferens extending sinuously along median line. Cirrus absent. Genital atrium complex, ventral to cecal bifurcation. Anterolateral pouches 81–110 (94) long by 57–77 (69) wide, muscular, somewhat reniform; aperture armed with 8–14 (10) curved, rooted spines 15–22 (19) long; 1 or 2 large, trirooted spines 26–38 (30) long of variable shape and sometimes fused; 1 or 2 small stout spines 7–9 (8) long. Posterolateral pouches 117–139 (125) long by 70–106 (87) wide, somewhat cordate; thickened muscular aperture armed with 17–24 (22) bifid spines; 1 or 2 simple spines 9–13 (10) long; median muscular part extending posteriorly, terminating in glandular base. On each side anterolateral and posterolateral pouches connected by series of 11–17 (14) small spherical unarmed pouches. Genital pore 308–409 (367) from anterior end.

Ovary 717–838 (760) long by 59–117 (89) wide, pretesticular, U-shaped; proximal end dextral, crossing diagonally to sinistral, extending anteriorly some distance, recrossing median line, descending to just anterior to proximal end. Ootype somewhat sinistral, 88–137 (112) long by 18–27 (21) wide; surrounded by numerous Mehlis's cells. Vitellaria follicular, coextensive with cecal diverticula. Vitelline reservoir Y-shaped, 215–220 (218) long by 35–47 (42) wide. Vaginal pore dorsomedial, 0.912–1.162 (1.016) mm from anterior end; vaginal chamber muscular, 88–97 (91) long by 57–88 (77) wide, with 2 posterolateral chambers; vaginae paired, thin, difficult to follow. Eggs 110–130 (117) long by 44–73 (60) wide, with single long filament at abopercular pole.

HOSTS: *Seriphus politus* Ayres (queenfish), Sciaenidae, 13.5–16.4 cm S.L. (type host); *Menticirrhus undulatus* (Girard) (California corbina), Sciaenidae; 35.2–46.3 cm S.L.; *Umbrina roncador* Jordan and Gilbert (yellowfin croaker), Sciaenidae, 14.2–27.2 cm S.L.

HABITAT: Gill lamellae.

LOCALITY: Scripps Institution of Oceanography, La Jolla, California (32°52′N, 117°15′W).

DEPTH: Less than 10 m.

PREVALENCE AND INTENSITY: On 7 of 16 *S. politus* examined (43.8%), 1–7 per host; on 2 of 8 *M. undulatus* examined (25%), 1–5 per host; on 1 of 2 *U. roncador* examined (50%), 1 per host.

SPECIMENS DEPOSITED: Holotype: USNM Helm. Coll. No. 80956. Paratypes: USNM Helm. Coll. Nos. 80957–80959, HWML Nos. 31153–31156.

ETYMOLOGY: The specific name honors Dr. Donald R. Powers, Biology Department, George Fox College, Newberg, Oregon, for his friendship and contributions to the biology program of Biola University.

REMARKS: *Cynoscionicola powersi* most closely resembles *C. srivastavai* Bravo-Hollis and Caballero-Rodriguez, 1970 in general morphology of genital atrium, ovary, clamps, and bifid atrial spines, in number of testes, and in size of clamps. It differs from *C. srivastavai* by having wider buccal suckers (42–86 versus 34–36), a haptor that narrows gradually rather than having anterior wide and posterior constricted to form an appendagelike portion, ceca not confluent, large trirooted spines in anterolateral atrial pouches, more numerous middle atrial pouches (11–17 versus 4–8), 1 or 2 simple spines in posterolateral atrial pouch, and hosts of different species.

Price (1962b) established Heteraxinidae for species in the family Microcotylidae Taschenberg, 1879 having asymmetrical haptors and ovaries with both ends directed posteriorly. Kritsky et al. (1978) discussed and accepted the validity of Heteraxinidae. Price (1962b) placed *Microcotyle heteracantha* Manter, 1938 and *M. pseudheteracantha* Hargis, 1957 in *Cynoscionicola* (Heteraxinidae, Gonoplasiinae) and diagnosed the genus as having a genital atrium with 2 multiloculate armed anterior pockets and 2 posterior lateral muscular pouches armed with bident or trident spines. Lambert and Euzet (1979) described *C. similis* and *C. jamaicensis* and, in their review of the genus, placed *Cynoscionicola* in Microcotylidae, Microcotylinae on the basis of clamp anatomy alone. Bravo-Hollis (1982) added new hosts and localities for *C. sciaeniae* Tantalean, 1974 and *C. srivastavai*; retaining the genus in Heteraxinidae, she established the subfamily Cynoscionicolinae. Mamaev (1986) supressed Cynoscionicolinae in his revision of Microcotylidae and placed *Cynoscionicola* in Anchoromicrocotylinae Bravo-Hollis, 1981 with *Anchoromicrocotyle guaymensis* Bravo-Hollis, 1981 by emending the subfamily diagnosis to include the complex genital atrium

and "subsymmetrical haptor." However, *Anchoromicrocotyle* has a symmetrical haptor, large larval protohaptoral anchors, and an unarmed genital atrium completely different from *Cynoscionicola* (see Bravo-Hollis, 1981). An asymmetrical haptor and an ovary with both ends directed posteriorly are characters that justify Heteraxinidae. Because *Cynoscionicola* lacks a symmetrical haptor with large larval anchors and has an armed complex genital atrium, it is returned to Cynoscionicolinae (Heteraxinidae).

The geographic distribution of *Cynoscionicola* extends from Massachusetts to Florida, to the Gulf of Mexico, and to Guyana in the western Atlantic Ocean and from Peru to Mexico and the Gulf of California to southern California in the eastern Pacific Ocean.

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MEETING SCHEDULE
HELMINTHOLOGICAL SOCIETY OF WASHINGTON
1990–1991

(Wed) 10 Oct 1990	"Student Competition," Uniformed Services University of the Health Sciences, Bethesda, MD
(Wed) 14 Nov 1990	"Recent Advances in Protozoan Diseases in Domestic Animals," Parasitology Unit, U.S. Department of Agriculture, Beltsville, MD
(Wed) 5 Dec 1990	"To Be Announced," Plant Protection Institute, U.S. Department of Agriculture, Beltsville, MD
(Wed) 9 Jan 1991	"To Be Announced," Laboratory of Parasitic Diseases, National Institutes of Health, Bethesda, MD
(Wed) 13 Feb 1991	"New Developments in Malaria Research," Department of Immunoparasitology, U.S. Naval Medical Research Institute, Bethesda, MD
(Wed) 13 Mar 1991	"Chemotherapy of Parasitic Diseases," Division of Experimental Therapeutics, Walter Reed Army Institute of Research, Washington, DC
(Wed) 10 Apr 1991	"To Be Announced," School of Hygiene and Public Health, The Johns Hopkins University; and Medical College, University of Maryland, Baltimore, MD
(Sat) 4 May 1991	"To Be Announced," Department of Pathobiology, Veterinary School, University of Pennsylvania, New Bolton, PA; Royal Society of Tropical Medicine and Hygiene; and New Jersey Society for Parasitology